

Appl. No. 10/728,060
Amdt. Dated 09/01/2006
Reply to Office Action of June 1, 2006

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-7 (Canceled)

8. (Currently Amended) A reusable filter for replacing a throw-away spin-on oil filter cartridge for an internal combustion engine of the type having a filter cartridge having an internally threaded first opening at one end thereof for threading onto a filter mount on an engine, at least one second opening adjacent the first opening, and a face seal circumscribing the first and second openings for sealing against a filter mount, and a filter element therein, comprising:

a can-like body;

a tubular woven metal mesh filter element having an inner diameter and an outer diameter;

a cap having the first and second openings therein simulating the first and second openings in the throw-away spin-on oil filter cartridge the reusable filter is intended to replace, the second openings being a plurality of annular arc segment shaped openings distributed around the first openings and collectively occupying most of a full annular area; and,

a face seal on the cap simulating the face seal of the throw-away spin-on oil filter cartridge the reusable filter is intended to replace;

the cap being removeably assembleable to the can-like body with a first side for facing a filter mount and a second side facing the can-like body;

the tubular woven metal mesh filter element fitting within the enclosure defined by the can-like body and the cap and being imposed in the oil flow path between the first and second openings;

the annular arc segment shaped openings starting from the first side of the cap at locations within the outer diameter of the tubular woven filter element and tapering outward to the second side of the cap to outside the outer diameter of the cap to define a smooth, expanding area flow path from the first side of the cap to the second side of the cap and to an outer periphery of the tubular woven metal mesh filter element therein.

9. (Original) The reusable filter of claim 8 wherein the woven metal mesh filter element is a stainless steel tubular woven metal filter element.

10. (Original) The reusable filter of claim 8 wherein the woven metal mesh filter element is pleated.

11. (Original) The reusable filter of claim 8 wherein the tubular woven metal mesh filter element has a closure member permanently attached to a first end thereof, the tubular

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woven metal mesh filter element being assembleable in the reusable filter with a second end thereof facing the cap.

12. (Original) The reusable filter of claim 11 further comprised of an O-ring sealing the second end of the tubular woven metal mesh filter element against an inner surface of the cap.

13. (Original) The reusable filter of claim 8 wherein the cap and can-like body screw together.

14. (Original) The reusable filter of claim 13 further comprising an O-ring seal between the cap and the can-like body.

15. (Original) The reusable filter of claim 8 wherein the face seal on the cap is an O-ring.

16. (Previously Presented) The reusable filter of claim 8 further comprised of an O-ring sealing a second end of the tubular woven metal mesh filter element against an inner surface of the cap, and another O-ring sealing a first end of the tubular woven metal mesh filter element against a bottom surface of the can-like body.

17. (Previously Presented) The reusable filter of claim 8 further including within the enclosure a bypass valve responsive to a predetermined pressure difference between an outer periphery and an inner periphery of the filter element to provide an oil flow path between the outer periphery and inner periphery of the filter element when the pressure difference rises above the predetermined pressure difference.

18. (Original) The reusable filter of claim 8 further comprised of an internally and externally threaded insert fitting within the first opening, whereby a specific reusable filter may be used on any of a plurality of engines having different oil filter mounts.

19. (Currently Amended) A reusable filter for replacing a throw-away spin-on oil filter cartridge for an internal combustion engine of the type having a filter cartridge having an internally threaded first opening at one end thereof for threading onto a filter mount on an engine, at least one second opening adjacent the first opening, and a face seal circumscribing the first and second openings for sealing against a filter mount, and a filter element therein comprising:

- a can-like body;
- a tubular woven, pleated metal mesh filter element having an inner diameter and an outer diameter;
- a bypass valve within the can-like body responsive to a predetermined pressure difference between an outer periphery and an inner periphery of the filter element to provide an oil flow

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path between the outer periphery and inner periphery of the filter element when the pressure difference rises above the predetermined pressure difference;

a cap having the first and second openings therein simulating the first and second openings in the throw-away spin-on oil filter cartridge the reusable filter is intended to replace, the second openings being a plurality of annular arc segment shaped openings distributed around the first openings and collectively occupying most of a full annular area; and,

a face seal on the cap simulating the face seal of the throw-away spin-on oil filter cartridge the reusable filter is intended to replace;

the cap being removeably assembleable to the can-like body by cooperatively disposed screw threads on the cap and can-like body with a first side for facing a filter mount and a second side facing the can-like body;

the tubular woven, pleated metal mesh filter element fitting within the enclosure defined by the can-like body and the cap and being imposed in the oil flow path between the first and second openings;

the annular arc segment shaped openings starting from the first side of the cap at locations within the outer diameter of the tubular woven filter element and tapering outward to the second side of the cap to outside the outer diameter of the cap to define a smooth, expanding area flow path from the first side of the cap to the second side of the cap and to an outer periphery of the tubular woven metal mesh filter element therein.

20. (Original) The reusable filter of claim 19 further comprised of an internally and externally threaded insert fitting within the first opening, whereby a specific reusable filter may be used on any of a plurality of engines having different oil filter mounts.

21. (Original) The reusable filter of claim 19 wherein the woven metal mesh filter element is a stainless steel tubular woven metal filter element.

22. (Original) The reusable filter of claim 19 wherein the tubular woven pleated metal mesh filter element has a closure member permanently attached to a first end thereof, the tubular woven pleated metal mesh filter element being assembleable in the reusable filter with a second end thereof facing the cap.

23. (Original) The reusable filter of claim 22 further comprised of an O-ring sealing the second end of the tubular woven metal mesh filter element against an inner surface of the cap.

24. (Original) The reusable filter of claim 19 further comprising an O-ring seal between the cap and the can-like body.

25. (Original) The reusable filter of claim 24 wherein the face seal on the cap is an O-ring.

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26. (Previously Presented) The reusable filter of claim 19 further comprised of an O-ring sealing a second end of the tubular woven metal mesh filter element against an inner surface of the cap, and another O-ring sealing a first end of the tubular woven metal mesh filter element against a bottom surface of the can-like body.

27. (Previously Presented) The reuseable filter of claim 17 wherein the bypass valve is mounted on a member positioned between an inner end of the can-like body and a first end of the tubular woven metal mesh filter element.

28. (Previously Presented) The reuseable filter of claim 17 wherein the member on which the bypass valve is mounted is spaced away from the inner end of the can-like body by a plurality of feet.

29. (Previously Presented) The reusable filter of claim 28 further comprised of an O-ring sealing a second end of the tubular woven metal mesh filter element against an inner surface of the cap, and another O-ring sealing the first end of the tubular woven metal mesh filter element against the member on which the bypass valve is mounted.

30. (Previously Presented) The reuseable filter of claim 19 wherein the bypass valve is mounted on a member positioned between an inner end of the can-like body and a first end of the tubular woven metal mesh filter element.

31. (Previously Presented) The reuseable filter of claim 19 wherein the member on which the bypass valve is mounted is spaced away from the inner end of the can-like body by a plurality of feet.

32. (Previously Presented) The reusable filter of claim 19 further comprised of an O-ring sealing a second end of the tubular woven metal mesh filter element against an inner surface of the cap, and another O-ring sealing the first end of the tubular woven metal mesh filter element against the member on which the bypass valve is mounted.

33. (New) The reusable filter of claim 8 wherein the annular arc segment shaped openings are defined by surfaces comprising sections of a cone.

34. (New) The reusable filter of claim 8 wherein a region in the first side of the cap from an inner edge of the arc segments to a smaller diameter is recessed with respect to a region of the face seal on the cap.

35. (New) The reusable filter of claim 17 wherein the bypass valve is mounted on a flanged member spaced away from a bottom of the can-like body by a plurality of protrusions on the flanged member, the flanged member having a tubular extension for extending into the inner diameter of the tubular woven metal mesh filter element, the tubular extension having a

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spring loaded ball valve therein, and openings along the tubular member disposed to provide substantially unrestricted oil flow when the ball valve is open, an O-ring sealing a second end of the tubular woven metal mesh filter element against an inner surface of the cap, and another O-ring sealing a first end of the tubular woven metal mesh filter element against the flanged member.

36. (New) The reusable filter of claim 35 further comprising two O-rings sealing a second end of the tubular woven metal mesh filter element against an inner surface of the cap, and two O-rings sealing a first end of the tubular woven metal mesh filter element against the flanged member.

37. (New) The reusable filter of claim 19 wherein the annular arc segment shaped openings are defined by surfaces comprising sections of a cone.

38. (New) The reusable filter of claim 19 wherein a region in the first side of the cap from an inner edge of the arc segments to a smaller diameter is recessed with respect to a region of the face seal on the cap.

39. (New) The reusable filter of claim 31 wherein the bypass valve comprises a flanged member spaced away from a bottom of the can-like body by a plurality of protrusions on the flanged member, the flanged member having a tubular extension for extending into the inner diameter of the tubular woven metal mesh filter element, the tubular extension having a spring loaded ball valve therein, and openings along the tubular member disposed to provide substantially unrestricted oil flow when the ball valve is open, an O-ring sealing a second end of the tubular woven metal mesh filter element against an inner surface of the cap, and another O-ring sealing a first end of the tubular woven metal mesh filter element against the flanged member.

40. (New) The reusable filter of claim 35 further comprising two O-rings sealing a second end of the tubular woven metal mesh filter element against an inner surface of the cap, and two O-rings sealing a first end of the tubular woven metal mesh filter element against the flanged member.